TL-HP90

SERVICE MANUAL

US Model

Ver 1.0 2001.04

Photo : TL-HP90

Photo : TL-DR0140

SPECIFICATIONS

Dial signal	Tone, 10 pps (pulse) selectable
Dimensions	Approx. 3⅞ X 3⅛ X 5½ inches (w/h/d) (98 X 77 X 137.5 mm)
Mass	Approx. 9.17 oz (260 g)
Supplied accessories	Telephone line code: approx. 7 ft. (2m) Stereo audio cable (stereo mini-plug): approx. 3.5 ft. (1m) Headset TL-DR0140 Headset hanger Directories

Headset (TL-DR0140)

Dimension (Cord)	Approx. 7 ft. (2m)
Dimension (Plug)	3.5 mm dia.
Mass	Approx. 0.88 oz (25 g) (without cord)

<Receiver>

Type	Open air dynamic
Driver units	30 mm dia. (CCAW Voice coil)
Sensitivity	104 dB/mW
Impedance	24
Maximum input power	1000 mW (IEC)

<Microphone>

Type	Close-talking pipe microphone
Unit	Back electret condenser
Output impedance	Under 2.2 k
Closed circuit voltage level	-47 dB (0 dB = 1 V/Pa)

Design and specifications are subject to change without notice.

HANDS FREE TELEPHONE

9-873-109-11
2001D0200-1

Sony Corporation
Personal Audio Company
Shinagawa Tec Service Manual Production Group

SONY®

TABLE OF CONTENTS

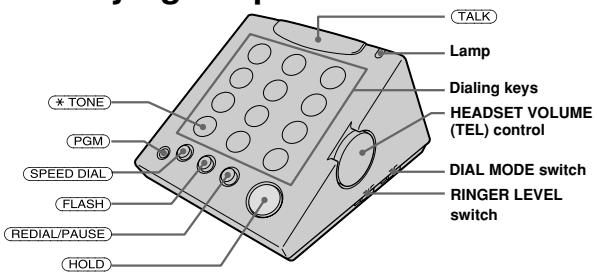
Notes on chip component replacement

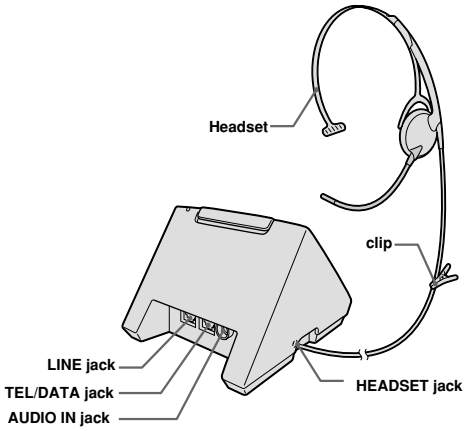
- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

SECTION 1
GENERAL

This section is extracted from instruction manual.

Identifying the part



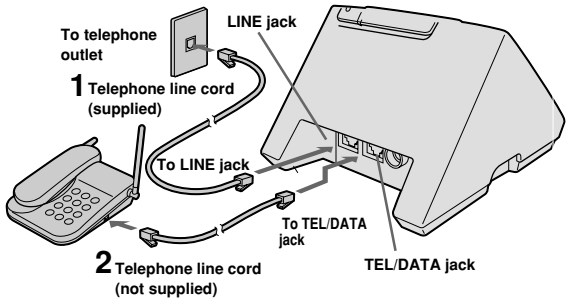


Setting up the phone

Connect the phone

1 Connect the telephone line cord (supplied) to the LINE jack, and to a telephone outlet.

2 Connect the telephone line cord (not supplied) to the TEL/DATA jack and to other phone or the modem if necessary.



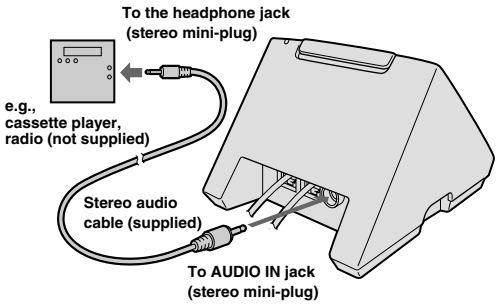
Tip

If your telephone outlet is not modular, contact your telephone service company for assistance.

Modular

Listening to music, etc. from an external equipment

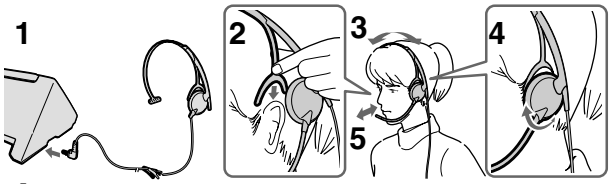
If you want to listen to music, etc. from the external equipment, you can do it using the headset during TALK off status.



Notes

- When you are listening to music, etc. with the external equipment connected to AUDIO IN jack, volume control on the headset is not available. Volume control is available with the connected equipment.
  Also, turning off the sound from the connected equipment can be done either by shutting down the power for the external equipment or by pulling out the stereo audio cable from AUDIO IN jack on this unit.
- During conversation, the voice from an external equipment cannot be heard.
- The sound of this unit is a monaural type.

Connect the headset



1 Connect the headset plug to the HEADSET jack.

2 Place the earpiece support unit behind the top of your ear.

3 Adjust the length of the headband so that the headset fits on **your ear.**

4 The earpiece can be rotated so it fits comfortably over either ear.

5 Position the headset microphone so that it is placed near the mouth.

Notes

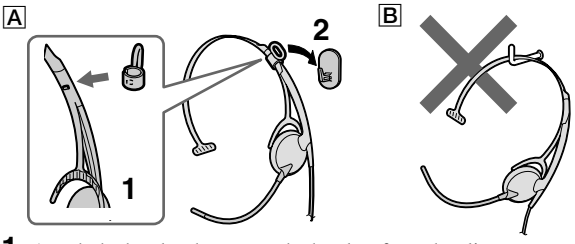
- Listening with headset at high volume may affect your hearing.
- The earpad may deteriorate due to long-term storage or use. If you need to replacing the earpad, it can be purchase separately (EP-Q1).

Tip

You can use the headset on either your right or left ear.

Using the headset hunger

The headset can be hung on the hook (supplied) by mounting the handset hanger (supplied) on the headset.



1 Attach the headset hanger to the headset from the slit as illustration **A.**
Be sure to insert the protrusion of the headset hanger to the projection of the headset.

2 Hang the headset hanger on the hook.

Note

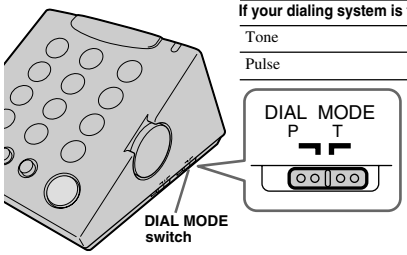
Do not hang the headset on as illustration **B.**

Choose the dialing mode

For the phone to work properly, select an appropriate dialing mode (tone or pulse).

Depending on your dialing system, set the DIAL MODE switch as follows:

If your dialing system is to	Set the switch
Tone	T
Pulse	P

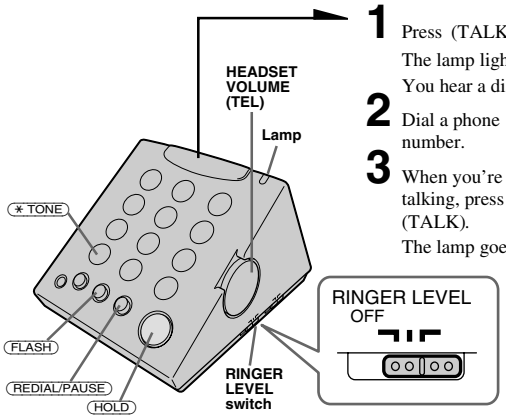


If you aren't sure of your dialing system

Make a trial call with the DIAL MODE switch set to T. If the call connects, leave the switch as is; otherwise, set the switch to P.

Making and receiving calls

Making a call



1 Press (TALK).
The lamp lights up.
You hear a dial tone.

2 Dial a phone number.

3 When you're done talking, press (TALK).
The lamp goes off.

Receiving a call

When you hear the phone ring, press (TALK) . When you're done talking, press (TALK) again.

Additional tasks

To	Do this
Adjust the ringer level	Set the RINGER LEVEL switch to H (high), L (low) or OFF
Adjust the receiver volume	Turn the HEADSET VOLUME (TEL) up to increase the receiver volume or down to decrease it.

(continued)

To	Do this
Switch to tone dialing temporarily	Press (✶ TONE) after you're connected. The line will remain in tone dialing until disconnected.
Put a call on hold	Press (HOLD). The HOLD button lights up. Press (HOLD) again to resume the conversation.
Switch to another call ("call waiting" service*)	Press (FLASH) . Press (FLASH) again to return to the first caller.

* You need to subscribe to this service with your telephone company.

Note

Pressing (HOLD) during dialing may stop transmission of the dial signal, causing you to dial the wrong phone number.

Redialing

1 Press (TALK).
The lamp lights up.

2 Press (REDIAL/PAUSE)

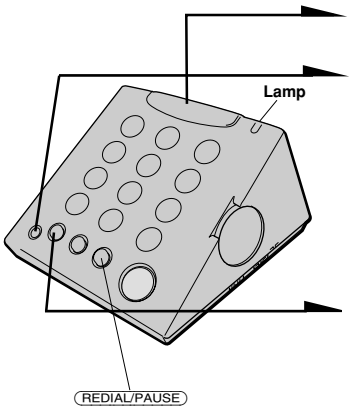
Notes

- If the number last dialed exceeds 31 digits for tone dialing or 32 digits for pulse dialing, the number cannot be dialed.
- The tone and pause are each counted as one digit.

Speed dialing

You can dial with a touch of a few buttons by storing a phone number on a dialing button. You can store up to 10 different phone numbers.

Storing phone numbers



1 Press (TALK).
The lamp lights up.

2 Press (PGM).

3 Enter the phone number you want to store.
You can enter up to 16 digits for pulse dialing or 15 digits for tone dialing. Note that tone and pause are each counted as one digit.

4 Press (SPEED DIAL).

5 Press one of the dialing buttons ((0) to (9)) for the phone number to be stored.
And the number is stored.

6 Press (TALK).
The lamp goes off.

Tips

- If you enter a wrong number, start from the beginning.
- Use the supplied directory to write down what you stored on the speed dialing numbers.

To store a number to be dialed via Private Branch Exchange (PBX)

Before entering a phone number in step 3, do as follows:

1 Enter the outside line access digit (e.g. 9).

2 Press (REDIAL/PAUSE).

To change a stored number

Store a new number as described above, and the old number will erased.

Making calls with speed dialing

1 Press (TALK).
The lamp lights up.

2 Press (SPEED DIAL).

3 Enter the desired speed dialing number ((0) to (9)).
The phone number stored in the speed dialing number will be dialed.

Note

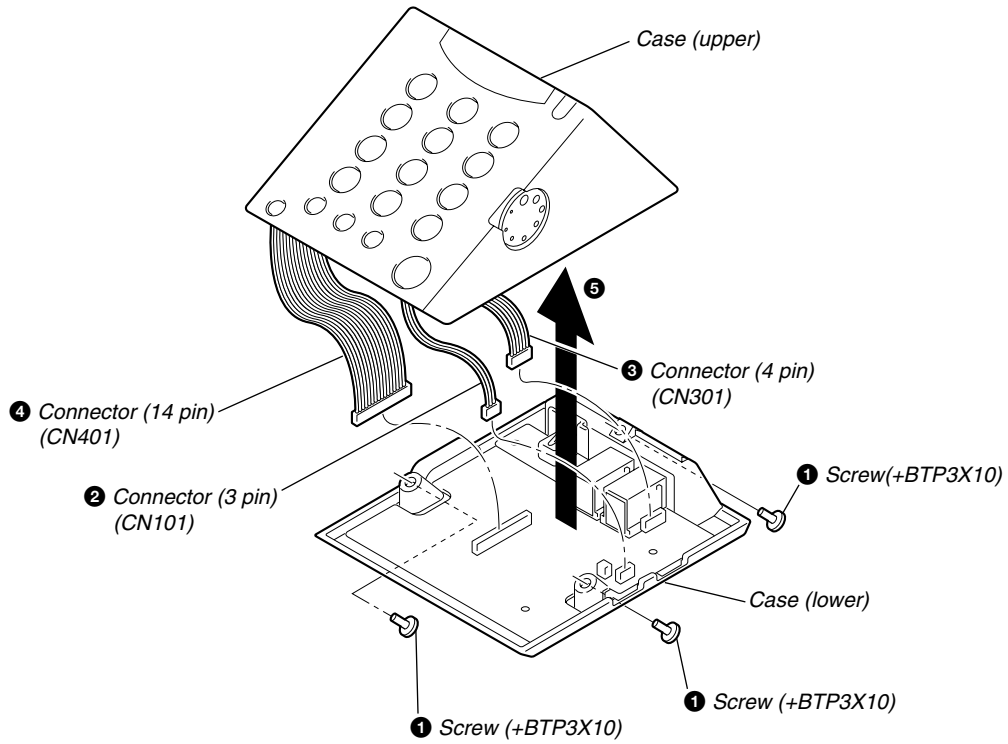
If this unit is disconnected from the line for 10 minutes or more, the stored speed dialing data is deleted from the memory.

SECTION 2
DISASSEMBLY

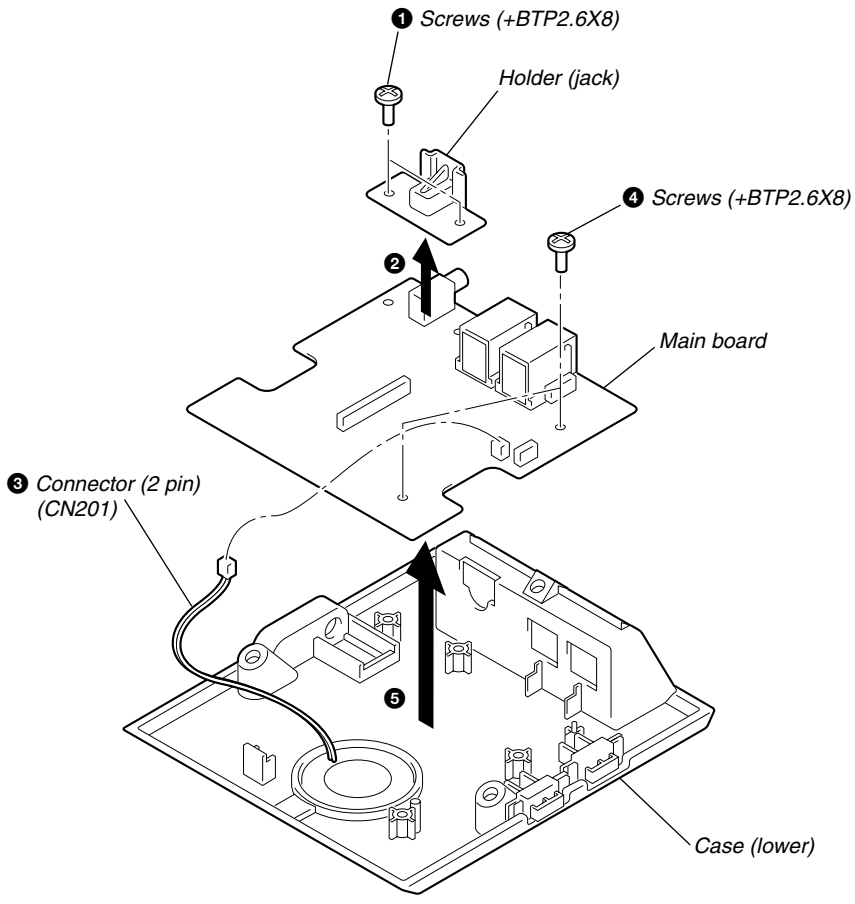
Note : Follow the disassembly procedure in the numerical order given.

Set → Case (upper) → Volume board, key board
Set → Case (lower) → Main board

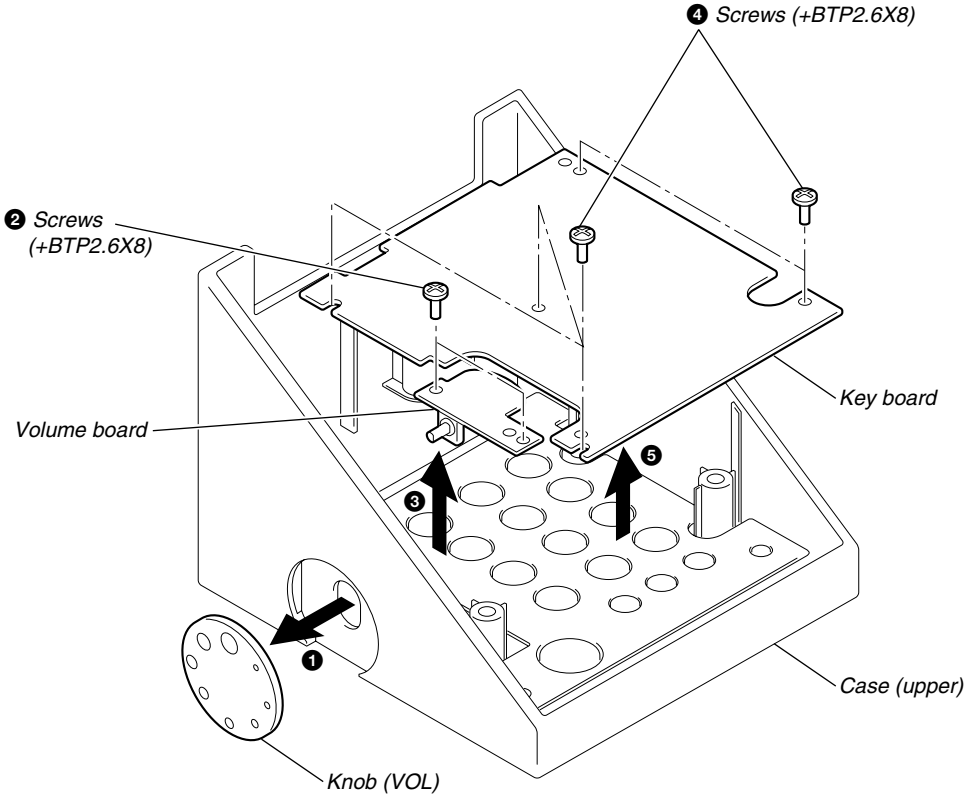
2-1. CASE (UPPER), CASE (LOWER)



2-2. MAIN BOARD

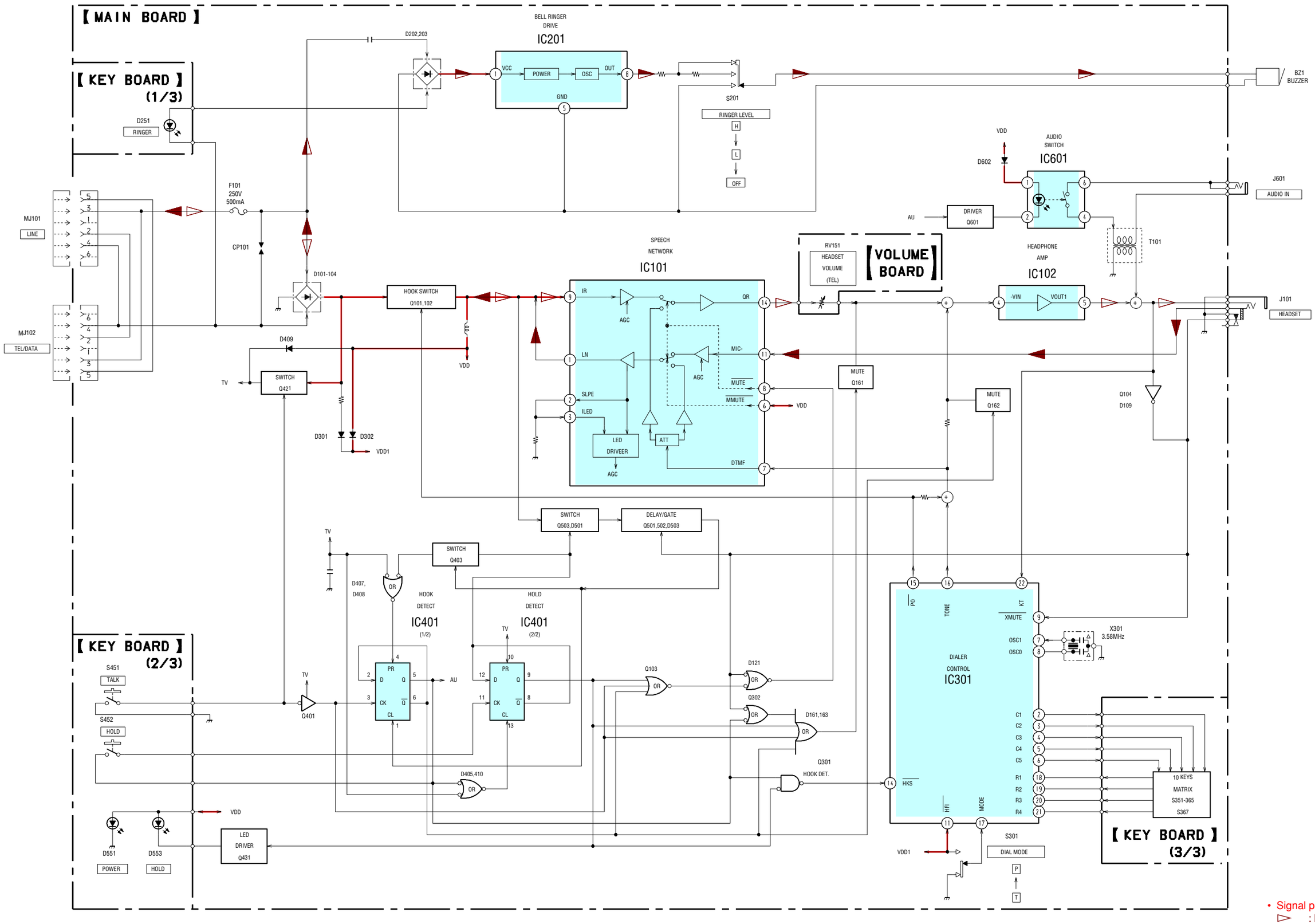


2-3. VOLUME BOARD, KEY BOARD



SECTION 3
DIAGRAMS

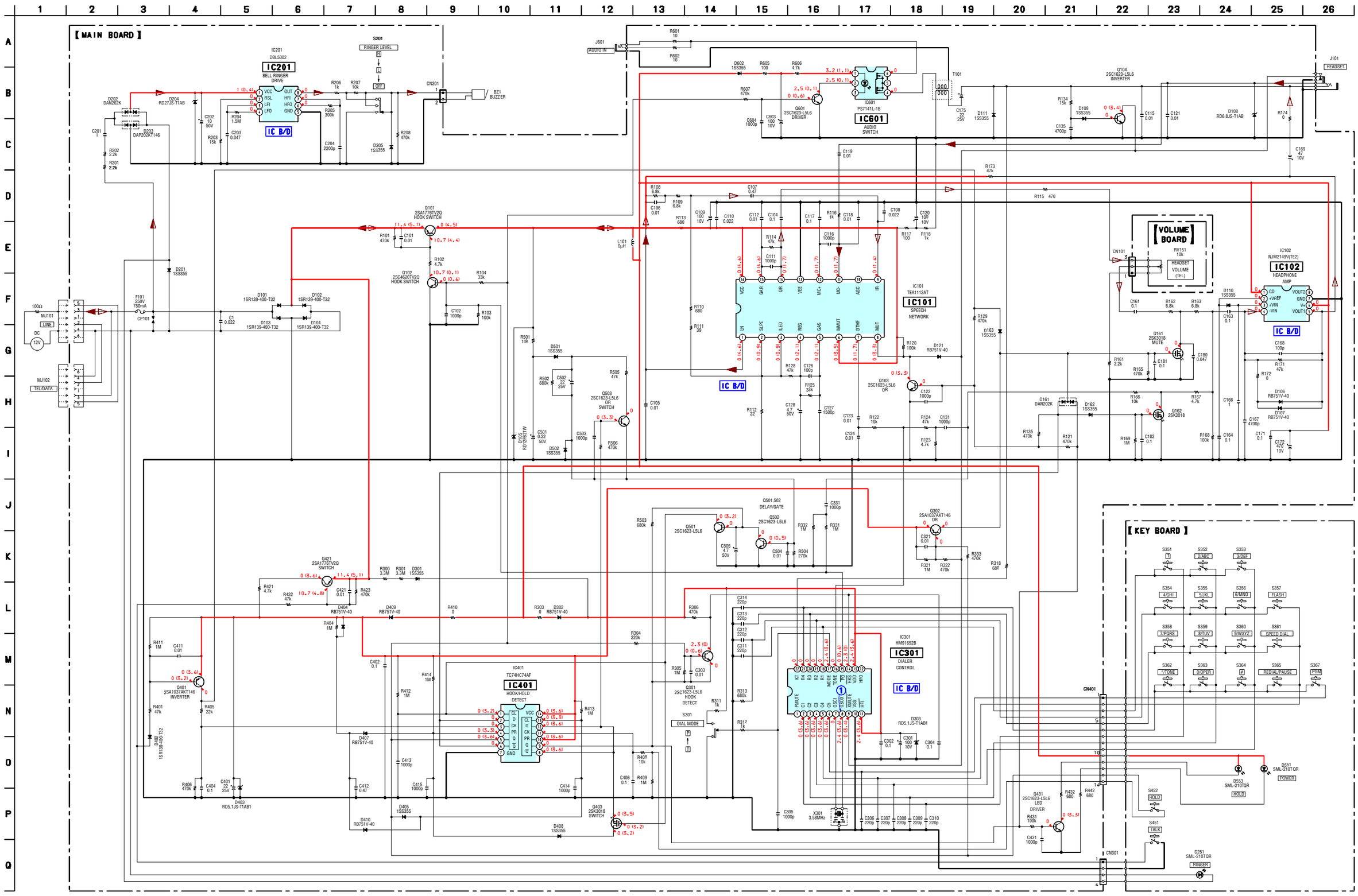
3-1. BLOCK DIAGRAMS



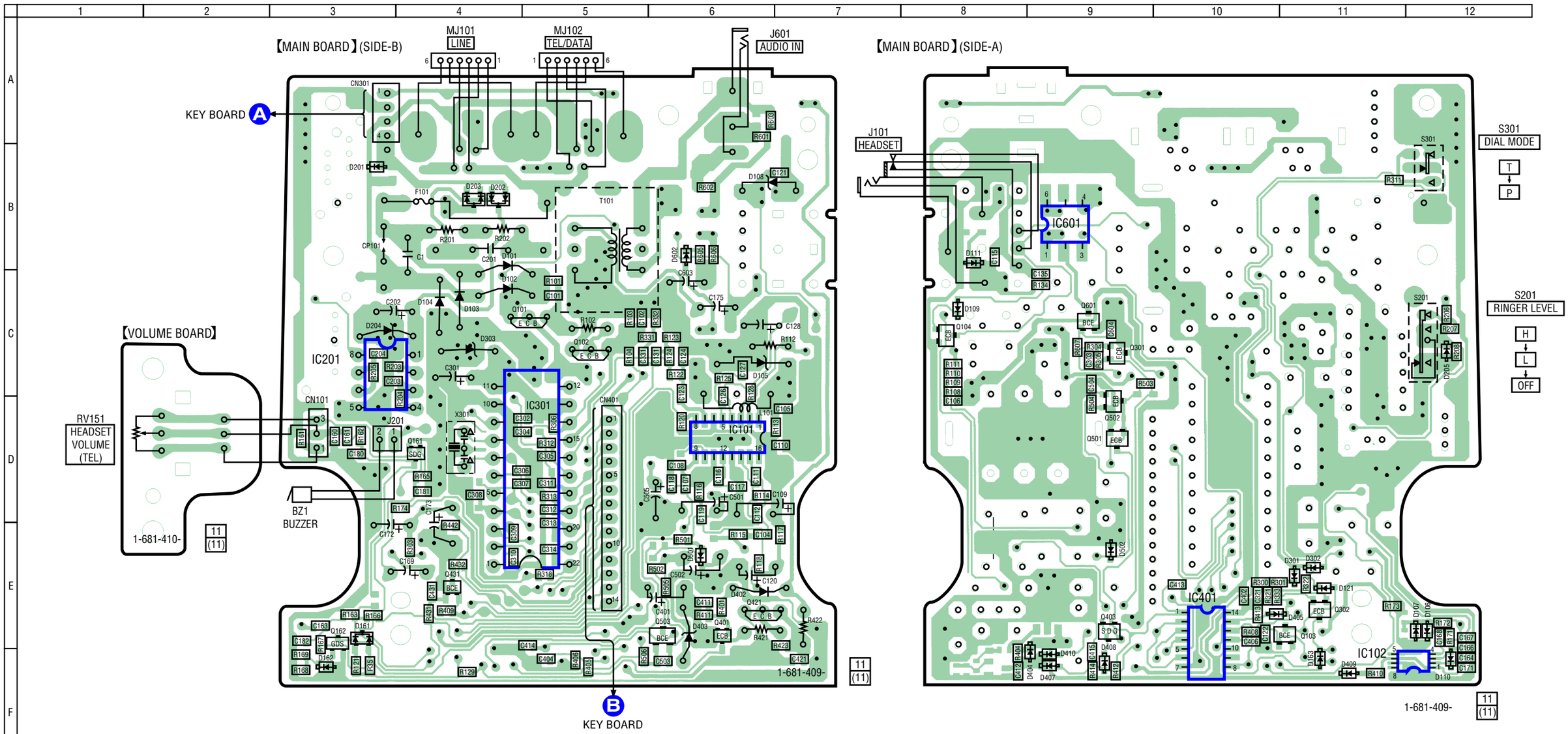
- Signal path.
  - : RX
  - : TX
  - : bell

3-2. SCHEMATIC DIAGRAM

● Refer to page 10 for Notes. ● Refer to page 10 for Waveforms. ● Refer to page 11, 12 for IC Block Diagrams.



3-3. PRINTED WIRING BOARDS – MAIN SECTION –



● **Semiconductor Location**

Ref. No.	Location	Ref. No.	Location	Ref. No.	Location	Ref. No.	Location
D101	B-4	D204	C-3	IC101	D-6	Q421	E-6
D102	C-4	D205	C-12	IC102	F-11	Q431	E-4
D103	C-4			IC201	C-3	Q501	D-9
D104	C-4	D301	E-11	IC301	D-5	Q502	D-9
D105	C-6	D302	E-11	IC401	E-10	Q503	E-6
		D303	C-4				
D106	E-12	D402	E-6	IC601	B-9	Q601	C-9
D107	E-12	D403	E-6				
D108	B-6						
D109	B-8	D404	F-9	Q101	C-5		
D110	F-12	D405	E-10	Q102	C-5		
		D407	F-9	Q103	E-11		
D111	C-8	D408	F-9	Q104	C-8		
D121	E-11	D409	F-11	Q161	D-4		
D161	E-3						
D162	F-3	D410	F-9	Q162	E-3		
D163	F-11	D501	E-6	Q301	C-9		
		D502	E-9	Q302	E-11		
D201	B-3	D602	B-6	Q401	E-6		
D202	B-4			Q403	E-9		
D203	B-4						

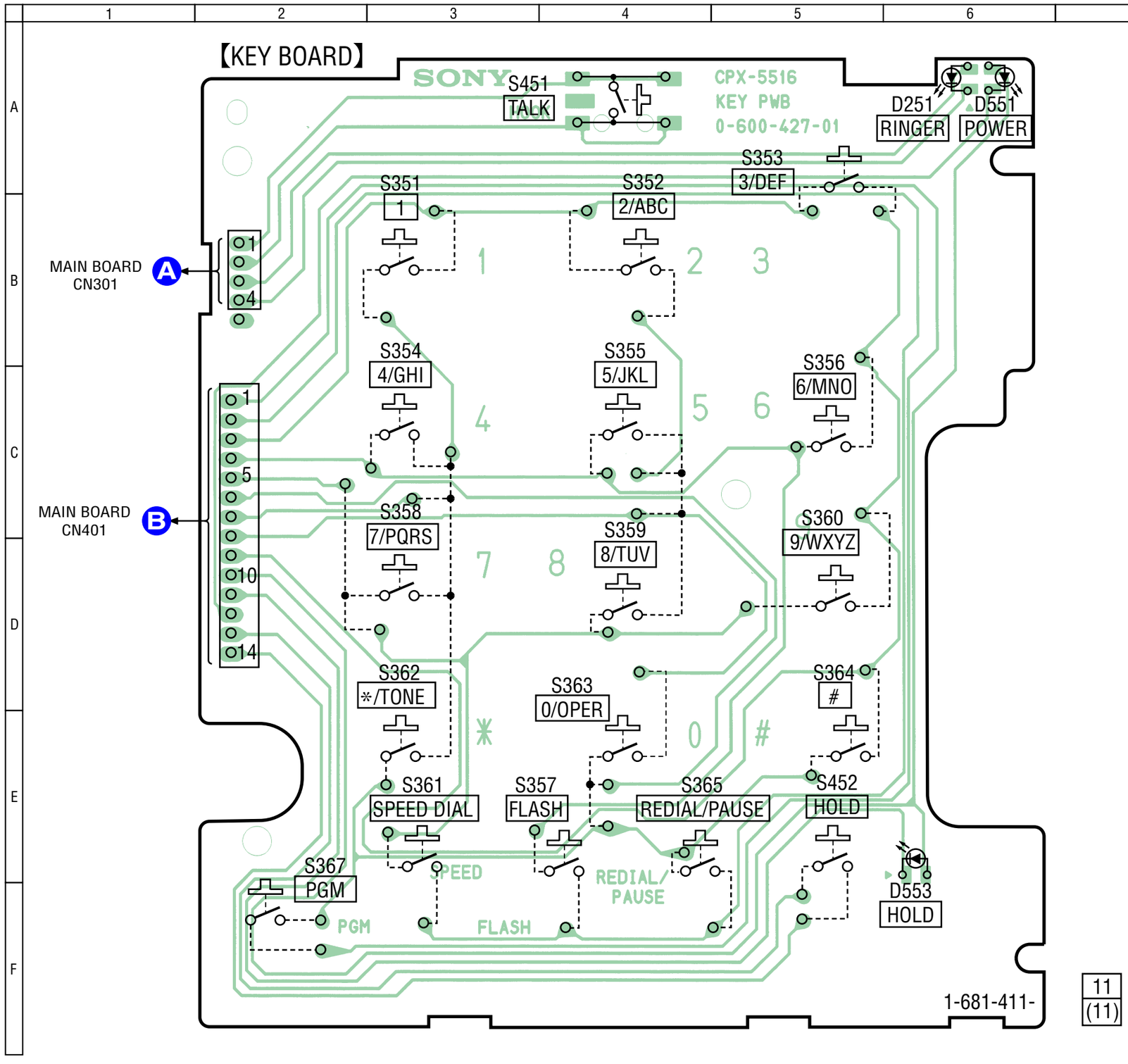
Note :

- ○——— : parts extracted from the component side.
- ● : Through hole.
- ▬ : Pattern from the side which enables seeing.

(The other layers' patterns are not indicated.)

Caution:	
Pattern face side: (Side B)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Side A)	Parts on the parts face side seen from the parts face are indicated.

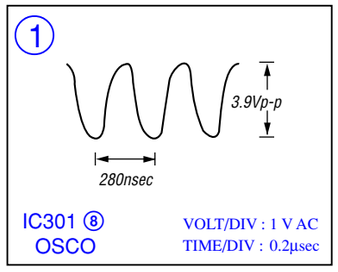
3-4. PRINTED WIRING BOARDS – KEY SECTION –



Note on Schematic Diagram: MAIN SECTION

- All capacitors are in μF unless otherwise noted. pF: μμF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- △ : internal component.
- ▭ : panel designation.
- B+ : B+ Line.
- Power voltage is dc 12V and fed with regulated dc power supply from MJ101.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
  no mark : TALK OFF
  ( ) : TALK ON
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ▷ : RX
  ▶ : TX
  ◥ : bell

● Waveforms

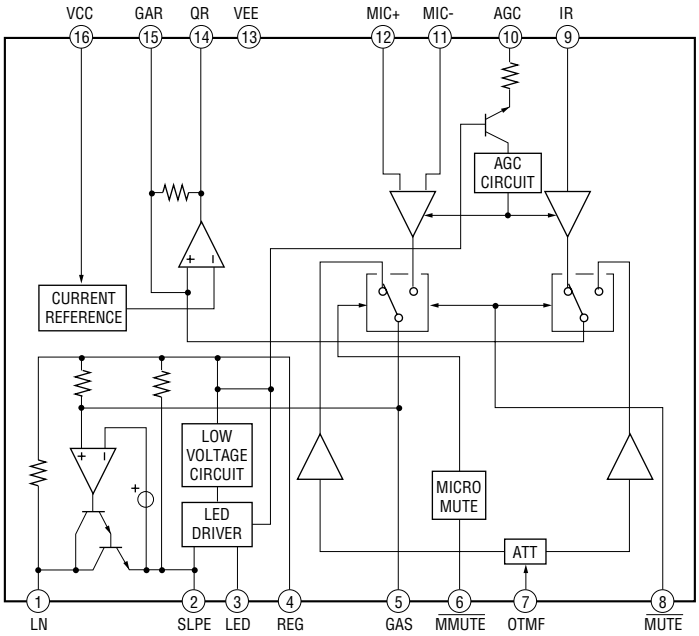


Note :

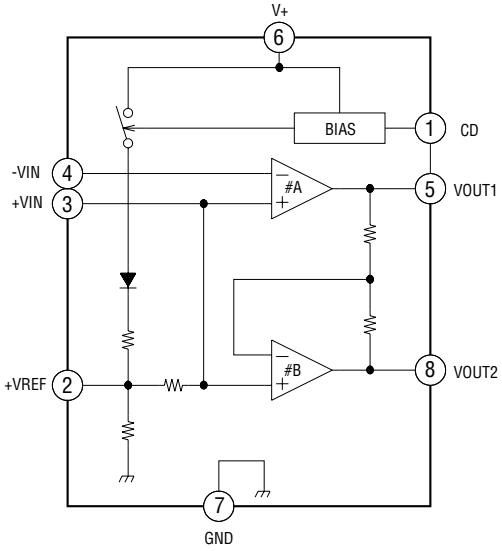
- ○——— : parts extracted from the component side.
- ▬ : Pattern from the side which enables seeing.
  (The other layers' patterns are not indicated.)
- ○·····○ : Connected with carbon pattern.

• IC BLOCK DIAGRAMS

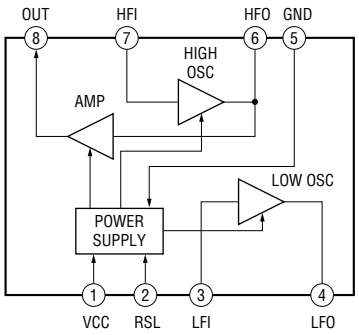
IC101 TEA1112AT/C1.518



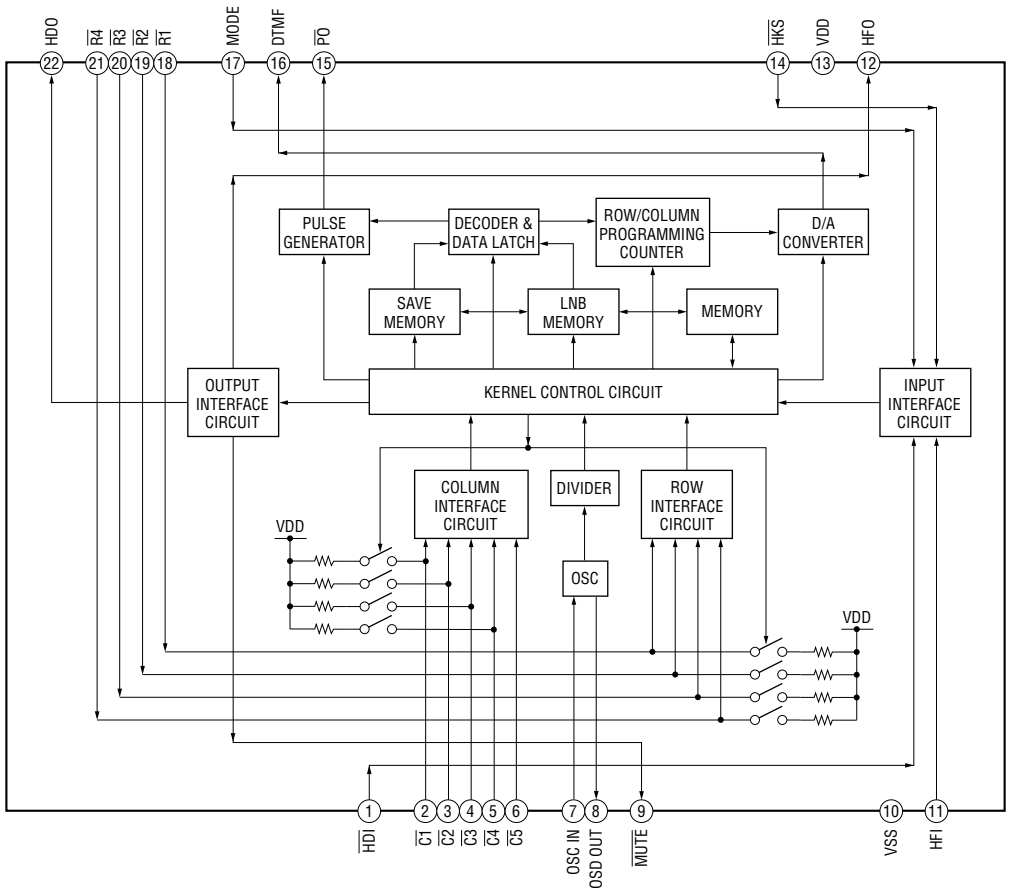
IC102 NJM2149V-TE2



IC201 DBL5002



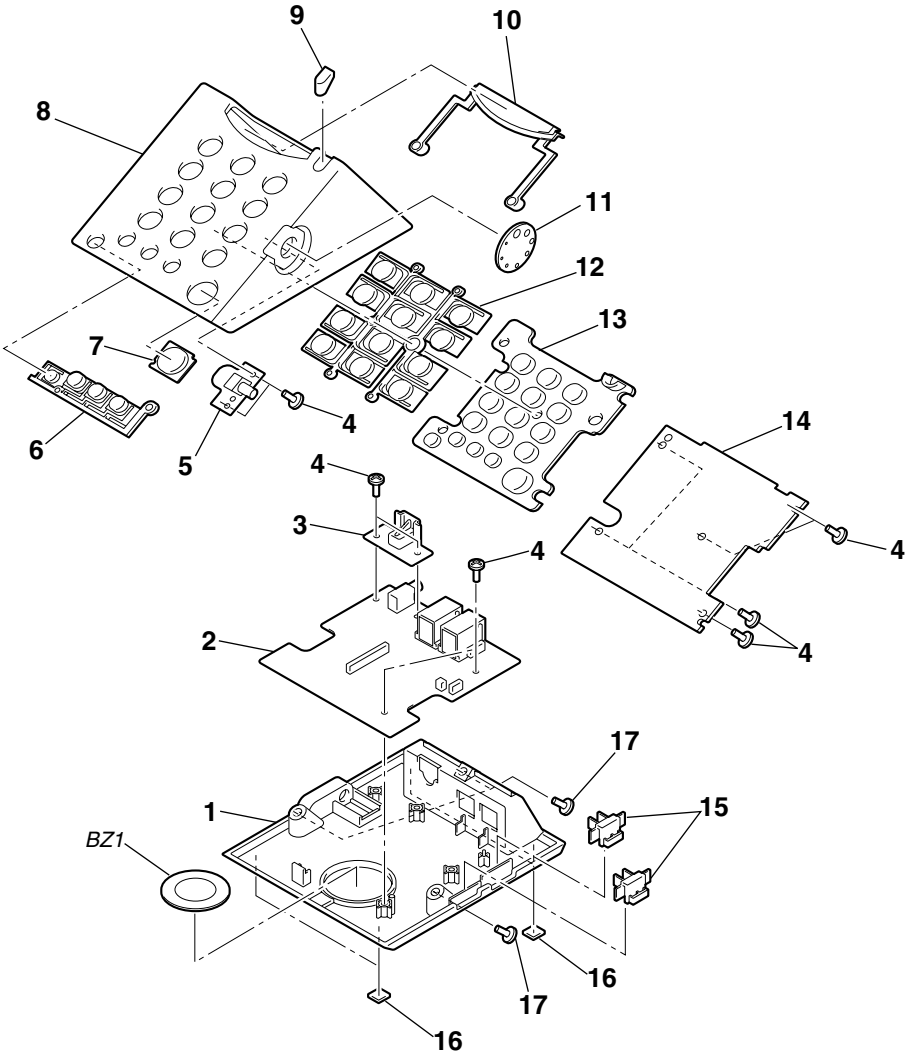
IC301 HM91652B



SECTION 4
EXPLODED VIEWS

NOTE :

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " * "are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.



Ref. No.	Part No.	Description	Remark
1	3-229-140-01	CASE (LOWER)	
* 2	A-3062-414-A	MAIN BOARD, COMPLETE	
3	3-229-147-01	HOLDER (JACK)	
4	7-685-534-19	SCREW +BTP 2.6X8 TYPE2 N-S	
5	1-681-410-11	VOLUME BOARD	
6	3-229-142-01	KEY, 4 GANG	
7	3-229-144-01	KNOB (HOLD)	
8	3-229-139-01	CASE (UPPER)	
9	3-229-148-01	LENS (LED)	
10	3-229-143-01	KNOB (HOOK)	
11	3-229-146-01	KNOB (VOL)	
12	3-229-141-01	KEY, 12 GANG	
13	1-786-144-11	SWITCH, RUBBER KEY	
14	1-786-144-11	KEY BOARD	
15	3-229-145-01	KNOB (SLIDE)	
16	3-230-678-01	FOOT, RUBBER	
17	7-685-547-19	SCREW +BTP 3X10 TYPE2 N-S	
BZ1	1-505-161-11	BUZZER, PIEZOELECTRIC	

MAIN

SECTION 5
ELECTRICAL PARTS LIST

NOTE :

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms
  METAL : Metal-film resistor
  METAL OXIDE :Metal oxide-film resistor
  F : nonflammable
- Items marked " * "are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u : μ , for example :
  uA.... : μ A.... , uPA.... : μ PA....
  uPB.... : μ PB.... , uPC.... : μ PC....
  uPD.... : μ PD....
- CAPACITORS
  uF : μ F
- COILS
  uH : μ H

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description			Remark
*	A-3062-414-A	MAIN BOARD, COMPLETE			
		**********			
		<CAPACITOR>			
C1	1-136-205-11	MYLAR	0.022uF	10%	400V
C101	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C102	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C104	1-125-891-11	CERAMIC CHIP	0.47uF	10%	10V
C105	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C106	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C107	1-125-891-11	CERAMIC CHIP	0.47uF	10%	10V
C108	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C109	1-104-665-11	ELECT	100uF	20%	10V
C110	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C111	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C112	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C115	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C116	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C117	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C118	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C119	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C120	1-104-665-11	ELECT	100uF	20%	10V
C121	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C122	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C123	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C124	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C126	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C127	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C128	1-126-963-11	ELECT	4.7uF	20%	50V
C131	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C135	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C161	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C163	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C164	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C166	1-115-156-11	CERAMIC CHIP	1uF		10V
C167	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C168	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C169	1-104-664-11	ELECT	47uF	20%	10V
C171	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C172	1-126-935-11	ELECT	470uF	20%	10V
C175	1-128-551-11	ELECT	22uF	20%	25V
C180	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C181	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C182	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C201	1-130-798-00	MYLAR	1uF	10%	250V
C202	1-126-964-11	ELECT	10uF	20%	50V
C203	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C204	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C301	1-104-665-11	ELECT	100uF	20%	10V
C302	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C303	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C304	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C305	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C306	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C307	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C308	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C309	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C310	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C311	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C312	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C313	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C314	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C321	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C331	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C401	1-128-551-11	ELECT	22uF	20%	25V
C402	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C404	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C406	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C411	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C412	1-125-891-11	CERAMIC CHIP	0.47uF	10%	10V
C413	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C414	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C415	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C421	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C431	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C501	1-126-957-11	ELECT	0.22uF	20%	50V
C502	1-128-551-11	ELECT	22uF	20%	25V
C503	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C504	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C505	1-126-963-11	ELECT	4.7uF	20%	50V
C603	1-104-665-11	ELECT	100uF	20%	10V
C604	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V

Ref. No.	Part No.	Description	Remark
		<CONNECTOR>	
* CN101	1-564-705-11	PIN, CONNECTOR (SMALL TYPE) 3P	
* CN201	1-564-704-11	PIN, CONNECTOR (SMALL TYPE) 2P	
* CN301	1-564-706-11	PIN, CONNECTOR (SMALL TYPE) 4P	
* CN401	1-564-716-11	PIN, CONNECTOR (SMALL TYPE)14P	
		<SURGE ABSORBER>	
CP101	1-533-751-11	ABSORBER, SURGE	
		<DIODE>	
D101	8-719-970-02	DIODE 1SR139-400	
D102	8-719-970-02	DIODE 1SR139-400	
D103	8-719-970-02	DIODE 1SR139-400	
D104	8-719-970-02	DIODE 1SR139-400	
D105	8-719-160-56	DIODE RD12FB2	
D106	8-719-060-48	DIODE RB751V-40TE-17	
D107	8-719-060-48	DIODE RB751V-40TE-17	
D108	8-719-115-60	DIODE RD6.8JS-T1AB	
D109	8-719-988-61	DIODE 1SS355TE-17	
D110	8-719-988-61	DIODE ISS355TE-17	
D111	8-719-988-61	DIODE 1SS355TE-17	
D121	8-719-060-48	DIODE RB751V-40TE-17	
D161	8-719-914-43	DIODE DAN202K	
D162	8-719-988-61	DIODE 1SS355TE-17	
D163	8-719-988-61	DIODE 1SS355TE-17	
D201	8-719-988-61	DIODE 1SS355TE-17	
D202	8-719-914-43	DIODE DAN202K	
D203	8-719-914-44	DIODE DAP202K	
D204	8-719-116-92	DIODE RD27JS-T1AB	
D205	8-719-988-61	DIODE 1SS355TE-17	
D301	8-719-988-61	DIODE 1SS355TE-17	
D302	8-719-060-48	DIODE RB751V-40TE-17	
D303	8-719-114-29	DIODE RD5.1JSAB1	
D402	8-719-970-02	DIODE 1SR139-400	
D403	8-719-114-29	DIODE RD5.1JSAB1	
D404	8-719-060-48	DIODE RB751V-40TE-17	
D405	8-719-988-61	DIODE 1SS355TE-17	
D407	8-719-060-48	DIODE RB751V-40TE-17	
D408	8-719-988-61	DIODE 1SS355TE-17	
D409	8-719-060-48	DIODE RB751V-40TE-17	
D410	8-719-060-48	DIODE RB751V-40TE-17	
D501	8-719-988-61	DIODE 1SS355TE-17	
D502	8-719-988-61	DIODE 1SS355TE-17	
D602	8-719-988-61	DIODE 1SS355TE-17	
		<FUSE>	
F101	1-576-532-11	FUSE 250V 750mA	
		<IC>	
IC101	8-759-646-12	IC TEA1112AT/C1.518	
IC102	8-759-582-03	IC NJM2149V-TE2	
IC201	8-759-595-76	IC DBL5002	
IC301	8-759-582-35	IC HM91652B	
IC401	8-759-925-90	IC TC74HC74AF	
IC601	8-749-019-66	PHOTO COUPLER PS7141L-1B-E3	

Ref. No.	Part No.	Description			Remark
		<JACK>			
J101	1-785-368-11	JACK (HEADSET)			
J601	1-566-822-21	JACK (AUDIO IN)			
		<COIL>			
L101	1-424-808-11	INDUCTOR 0uH			
		<MODULAR JACK>			
MJ101	1-770-484-41	JACK, MODULAR (4C) 6P			
MJ102	1-770-484-41	JACK, MODULAR (4C) 6P			
		<TRANSISTOR>			
Q101	8-729-045-65	TRANSISTOR 2SA1776TV2Q			
Q102	8-729-045-47	TRANSISTOR 2SC4620TV2Q			
Q103	8-729-120-28	TRANSISTOR 2SC1623-L5L6			
Q104	8-729-120-28	TRANSISTOR 2SC1623-L5L6			
Q161	8-729-048-50	TRANSISTOR 2SK3018-T106			
Q162	8-729-048-50	TRANSISTOR 2SK3018-T106			
Q301	8-729-120-28	TRANSISTOR 2SC1623-L5L6			
Q302	8-729-026-49	TRANSISTOR 2SA1037AK-T146-R			
Q401	8-729-026-49	TRANSISTOR 2SA1037AK-T146-R			
Q403	8-729-048-50	TRANSISTOR 2SK3018-T106			
Q421	8-729-045-65	TRANSISTOR 2SA1776TV2Q			
Q431	8-729-120-28	TRANSISTOR 2SC1623-L5L6			
Q501	8-729-120-28	TRANSISTOR 2SC1623-L5L6			
Q502	8-729-120-28	TRANSISTOR 2SC1623-L5L6			
Q503	8-729-120-28	TRANSISTOR 2SC1623-L5L6			
Q601	8-729-120-28	TRANSISTOR 2SC1623-L5L6			
		<RESISTOR>			
R101	1-216-853-11	METAL CHIP	470K	5%	1/16W
R102	1-249-425-11	CARBON	4.7K	5%	1/4W F
R103	1-216-845-11	METAL CHIP	100K	5%	1/16W
R104	1-216-839-11	METAL CHIP	33K	5%	1/16W
R108	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R109	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R110	1-216-819-11	METAL CHIP	680	5%	1/16W
R111	1-216-804-11	METAL CHIP	39	5%	1/16W
R112	1-247-791-91	CARBON	22	5%	1/4W
R113	1-216-819-11	METAL CHIP	680	5%	1/16W
R114	1-216-841-11	METAL CHIP	47K	5%	1/16W
R115	1-216-817-11	METAL CHIP	470	5%	1/16W
R116	1-216-821-11	METAL CHIP	1K	5%	1/16W
R117	1-216-809-11	METAL CHIP	100	5%	1/16W
R118	1-216-821-11	METAL CHIP	1K	5%	1/16W
R120	1-216-845-11	METAL CHIP	100K	5%	1/16W
R121	1-216-853-11	METAL CHIP	470K	5%	1/16W
R122	1-216-833-11	METAL CHIP	10K	5%	1/16W
R123	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R124	1-216-841-11	METAL CHIP	47K	5%	1/16W
R125	1-216-839-11	METAL CHIP	33K	5%	1/16W
R128	1-216-841-11	METAL CHIP	47K	5%	1/16W
R129	1-216-853-11	METAL CHIP	470K	5%	1/16W
R134	1-216-835-11	METAL CHIP	15K	5%	1/16W
R135	1-216-853-11	METAL CHIP	470K	5%	1/16W
R161	1-216-825-11	METAL CHIP	2.2K	5%	1/16W

MAIN KEY VOLUME

Ref. No.	Part No.	Description			Remark
R162	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R163	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R165	1-216-853-11	METAL CHIP	470K	5%	1/16W
R166	1-216-833-11	METAL CHIP	10K	5%	1/16W
R167	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R168	1-216-845-11	METAL CHIP	100K	5%	1/16W
R169	1-216-857-11	METAL CHIP	1M	5%	1/16W
R171	1-216-841-11	METAL CHIP	47K	5%	1/16W
R172	1-216-864-11	METAL CHIP	0	5%	1/16W
R173	1-216-841-11	METAL CHIP	47K	5%	1/16W
R174	1-216-864-11	METAL CHIP	0	5%	1/16W
R201	1-249-421-11	CARBON	2.2K	5%	1/4W F
R202	1-249-421-11	CARBON	2.2K	5%	1/4W F
R203	1-216-835-11	METAL CHIP	15K	5%	1/16W
R204	1-216-859-11	RES-CHIP	1.5M	5%	1/16W
R205	1-216-851-11	METAL CHIP	330K	5%	1/16W
R206	1-216-821-11	METAL CHIP	1K	5%	1/16W
R207	1-216-833-11	METAL CHIP	10K	5%	1/16W
R208	1-216-853-11	METAL CHIP	470K	5%	1/16W
R300	1-216-863-11	RES-CHIP	3.3M	5%	1/16W
R301	1-216-863-11	RES-CHIP	3.3M	5%	1/16W
R303	1-216-864-11	METAL CHIP	0	5%	1/16W
R304	1-216-849-11	METAL CHIP	220K	5%	1/16W
R305	1-216-857-11	METAL CHIP	1M	5%	1/16W
R306	1-216-853-11	METAL CHIP	470K	5%	1/16W
R311	1-216-821-11	METAL CHIP	1K	5%	1/16W
R312	1-216-821-11	METAL CHIP	1K	5%	1/16W
R313	1-216-855-11	METAL CHIP	680K	5%	1/16W
R318	1-216-819-11	METAL CHIP	680	5%	1/16W
R321	1-216-857-11	METAL CHIP	1M	5%	1/16W
R322	1-216-853-11	METAL CHIP	470K	5%	1/16W
R331	1-216-857-11	METAL CHIP	1M	5%	1/16W
R332	1-216-857-11	METAL CHIP	1M	5%	1/16W
R333	1-216-853-11	METAL CHIP	470K	5%	1/16W
R401	1-216-841-11	METAL CHIP	47K	5%	1/16W
R404	1-216-857-11	METAL CHIP	1M	5%	1/16W
R405	1-216-837-11	METAL CHIP	22K	5%	1/16W
R406	1-216-853-11	METAL CHIP	470K	5%	1/16W
R408	1-216-833-11	METAL CHIP	10K	5%	1/16W
R409	1-216-857-11	METAL CHIP	1M	5%	1/16W
R410	1-216-864-11	METAL CHIP	0	5%	1/16W
R411	1-216-857-11	METAL CHIP	1M	5%	1/16W
R412	1-216-857-11	METAL CHIP	1M	5%	1/16W
R413	1-216-857-11	METAL CHIP	1M	5%	1/16W
R414	1-216-857-11	METAL CHIP	1M	5%	1/16W
R421	1-249-425-11	CARBON	4.7K	5%	1/4W F
R422	1-249-437-11	CARBON	47K	5%	1/4W
R423	1-216-853-11	METAL CHIP	470K	5%	1/16W
R431	1-216-845-11	METAL CHIP	100K	5%	1/16W
R432	1-216-819-11	METAL CHIP	680	5%	1/16W
R442	1-216-819-11	METAL CHIP	680	5%	1/16W
R501	1-216-833-11	METAL CHIP	10K	5%	1/16W
R502	1-216-855-11	METAL CHIP	680K	5%	1/16W
R503	1-216-855-11	METAL CHIP	680K	5%	1/16W
R504	1-216-850-11	METAL CHIP	270K	5%	1/16W
R505	1-216-841-11	METAL CHIP	47K	5%	1/16W
R506	1-216-853-11	METAL CHIP	470K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R601	1-216-797-11	METAL CHIP	10	5%	1/16W
R602	1-216-797-11	METAL CHIP	10	5%	1/16W
R605	1-216-809-11	METAL CHIP	100	5%	1/16W
R606	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R607	1-216-853-11	METAL CHIP	470K	5%	1/16W
		<SWITCH>			
S201	1-554-061-00	SWITCH, SLIDE (RINGER LEVEL)			
S301	1-786-181-11	SWITCH, SLIDE (DIAL MODE)			
		<TRANSFORMER>			
T101	1-437-370-11	TRANSFORMER, INPUT			
		<VIBRATOR			
X301	1-579-673-21	VIBRATOR, CERAMIC (3.58MHz)			
**********					
*	1-681-411-11	KEY BOARD			
		*********			
		<LED>			
D251	8-719-077-82	LED SML-210JTT86PQ (RING)			
D551	8-719-077-82	LED SML-210JTT86PQ (POWER)			
D553	8-719-077-82	LED SML-210JTT86PQ (HOLD)			
		<SWITCH>			
S451	1-771-895-21	SWITCH, TACTILE (REFLOW TYPE) (TALK)			
**********					
*	1-681-410-11	VOLUME BOARD			
		**********			
		<VARIABLE RESISTOR>			
RV151	1-227-420-11	RES, VAR, CARBON 10K (HEADSET VOLUME)			
**********					
		MISCELLANEOUS			
		**********			
13	1-786-144-11	SWITCH, RUBBER KEY			
BZ1	1-505-161-11	BUZZER, PIEZOELECTRIC			
**********					
		ACCESSORIES & PACKING MATERIALS			
		**********			
	1-696-454-11	CORD (WITH MODULAR PLUG)(LINE)			
	1-823-019-11	CORD, CONNECTION (STEREO MINI-PLUG)			
	3-231-904-11	MANUAL, INSTRUCTION (ENGLISH,SPANISH)			
	3-232-330-01	HANGER (H/S)			
	3-232-331-01	HOOK (WALL HOOK)			
	3-232-380-01	SHEET, SHORTENING NUMBER			
	3-232-411-01	TAPE			
	8-954-004-90	HEAD SET (TL-DR0140)			
	X-3380-768-1	CLIP ASSY			

REVISION HISTORY

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Ver.	Date	Description of Revision
1.0	2001.04	New